

5 a difference image analysis system receiving the difference image and determining whether the first die image and the second die image may each be used to form the reference die image using the difference image;

10 a controller combining the first die image and the second die image to form the reference die image and storing the reference die image in a reference die image memory.

51. (NEW) The system of claim 50 further comprising a die imaging system creating a digital representation of a die.

52. (NEW) The system of claim 50 further comprising a die image storage system storing data representative of the first die image and the second die image.

53. (NEW) The system of claim 50 wherein the difference image analysis system comprises a slope detector determining whether the slope of a histogram changes.

54. (NEW) The system of claim 50 wherein the difference image analysis system comprises a size detector determining whether a size of the anomalous region exceeds a predetermined allowable size.

55. (NEW) The system of claim 50 wherein the difference image analysis system comprises a density detector determining whether a number of anomalous regions per unit area exceeds a predetermined allowable number of anomalous regions per unit area.

56. (NEW) A system for storing reference die data comprising:

a camera generating digital image data of two or more dies;
and

5 a reference die detection system receiving the digital
image data of the dies and generating reference die image data;

a reference die image storage receiving the reference die
image data and storing the reference die image data; and

10 wherein pre-stored reference die image data is not used to
generate the reference die image data.

57. (NEW) The system of claim 56 wherein the reference die
detection system comprises an image comparator producing a
difference image from the first die image and the second die
image.

B1 58. (NEW) The system of claim 57 wherein the reference die
detection system comprises a difference analyzer determining
whether the difference image contains unacceptable features.

59. (NEW) The system of claim 58 wherein the difference
analyzer comprises a data sorter receiving brightness data
associated with a plurality of pixels of the difference image
and creating a histogram from the brightness data.

60. (NEW) The system of claim 59 wherein the difference
analyzer comprises a slope detector determining whether a slope
of the brightness data histogram changes as a brightness
magnitude increases.

61. (NEW) The system of claim 59 wherein the difference
analyzer comprises a dimension analyzer determining whether one
or more dimensions of a group of pixels exceeds one or more
predetermined allowable dimensions.

62. (NEW) The system of claim 59 wherein the difference analyzer comprises a density analyzer determining whether a density of two or more groups of pixels per unit area exceeds a predetermined allowable density.

63. (NEW) The system of claim 58 wherein the difference analyzer comprises a data sorter receiving image data associated with a plurality of pixels of the difference image and creating a histogram from the image data.

64. (NEW) The system of claim 63 wherein the difference analyzer comprises a slope detector determining whether a slope of the image data histogram changes as an image data magnitude increases.

65. (NEW) The system of claim 63 wherein the difference analyzer comprises a dimension analyzer determining whether one or more dimensions of a group of pixels per unit area exceeds one or more predetermined allowable dimensions.

66. (NEW) The system of claim 63 wherein the difference analyzer comprises a density analyzer determining whether a density of two or more groups of pixels per unit area exceeds a predetermined allowable density.

67. (NEW) A method for selecting a die image for use as a reference die image comprising:

generating first image data of a first die;
generating second image data of a second die;

5 determining whether the first image data and the second image data can be used to form the reference die image without using a pre-stored reference die image; and

combining the first image data and the second image data to form the reference die image.

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68. (NEW) The method of claim 67 wherein creating the difference image from source images comprises subtracting a first die image from a second die image.

69. (NEW) The method of claim 67 wherein identifying the region over which the slope of the histogram data changes comprises identifying the region over which the slope of the histogram data changes from negative to positive.

70. (NEW) The method of claim 67 wherein identifying the region over which the slope of the histogram data changes comprises determining whether a size of an area having a brightness deviation exceeds a predetermined allowable size.

71. (NEW) The method of claim 67 wherein identifying the region over which the slope of the histogram data changes comprises determining whether a number of areas having brightness deviations exceeds a predetermined allowable number of areas having brightness deviations per unit area.

72. (NEW) The method of claim 67 wherein identifying the region over which the slope of the histogram data changes comprises determining whether a number of areas having other image data deviations exceeds a predetermined allowable number of areas having image data deviations per unit area for image data other than brightness data.